

Amendments to the Claims

1. **(Currently Amended)** An optical transmission system for transmitting an optical signal ~~from a transmitter to a receiver~~ through a multi-mode fiber, the optical transmission system comprising:

a ~~wherein the transmitter comprises:~~ comprising:

a light emission element for generating an optical signal; and

at least one lens for converging the optical signal generated by ~~the said~~ light emission element ~~to focus at a focal point~~, wherein:

the optical signal converged by ~~the said~~ at least one lens enters an input plane of the multi-mode fiber to propagate through the multi-mode fiber; and

a ~~the receiver comprises~~ comprising a light receiving element for receiving the optical signal outputted from the multi-mode fiber; and, wherein

the input plane is placed at a position other than the focal point an optical axis of said at least one lens is aligned with a fiber axis of the multi-mode fiber,

a vertex of said at least one lens is located at a predetermined distance from the input plane of the multi-mode fiber, the predetermined distance being greater or less than a distance from the vertex of said at least one lens to a focal point of said at least one lens, and

the predetermined distance is selected based on an eye opening factor of the multi-mode fiber and a power of the optical signal.

2. **(Currently Amended)** The optical transmission system according to claim 1, wherein the input plane of the multi-mode fiber is placed at a position farther away from ~~the said~~ at least one lens than the focal point of said at least one lens.

3. **(Currently Amended)** A transmitter for outputting an optical signal toward a multi-mode fiber, the transmitter comprising:

a light emission element for generating an optical ~~signal,~~ signal; and

at least one lens for converging the optical signal generated by ~~the said~~ light emission element ~~to focus at a focal point~~, wherein:

the optical signal converged by ~~the~~ said at least one lens enters an input plane of the multi-mode fiber; and fiber to propagate through the multi-mode fiber.

~~the at least one lens is placed so that the input plane is at a position other than the focal point~~ an optical axis of said at least one lens is aligned with a fiber axis of the multi-mode fiber,

a vertex of said at least one lens is located at a predetermined distance from the input plane of the multi-mode fiber, the predetermined distance being greater or less than a distance from the vertex of said at least one lens to a focal point of said at least one lens, and

the predetermined distance is selected based on an eye opening factor of the multi-mode fiber and a power of the optical signal.

4. **(Currently Amended)** The transmitter according to claim 3, wherein the input plane of the multi-mode fiber is placed at a position farther away from ~~the~~ said at least one lens than the focal point of said at least one lens.

5. **(Currently Amended)** The transmitter according to claim 3, further comprising a receptacle for connecting to the multi-mode fiber to affix the input plane of the multi-mode fiber at a position other than the focal point of said at least one lens.

6. **(Currently Amended)** An optical transmission system for transmitting an optical signal ~~from a transmitter to a receiver~~ through a multi-mode fiber, the optical transmission system comprising:

~~a~~ wherein the transmitter comprises comprising:

a light emission element for generating an optical signal, and

at least one lens for converging the optical signal generated by ~~the~~ said light emission element ~~to focus at a focal point,~~ wherein:

the optical signal converged by ~~the~~ said at least one lens enters an input plane of the multi-mode fiber, propagates through the multi-mode fiber, and is outputted from an output plane of the multi-mode fiber; and

~~a~~ the receiver comprises comprising:

a light receiving element having a light-receiving plane for receiving the optical signal from the output plane of the multi-mode fiber; and

~~the light receiving plane of the light receiving element is placed at a predetermined distance from the output plane~~ a receptacle for connecting to the multi-mode fiber to affix the output plane of the multi-mode fiber at a predetermined distance from the light-receiving plane, wherein

said light receiving element receives a lower order mode of the optical signal and a higher order mode is prevented from entering the light-receiving plane of said light receiving element, and

the predetermined distance is determined based on a core diameter of the multi-mode fiber, a diameter of the light-receiving plane, and a maximum angle among angles of modes of the optical signal outputted from the output plane of the multi-mode fiber which are capable of entering the light-receiving plane.

7. **(Currently Amended)** The optical transmission system according to claim 6, wherein ~~the~~ said light receiving element is a Si PIN photodiode.

8. **(Currently Amended)** A receiver for receiving an optical signal outputted from a multi-mode fiber, the receiver comprising:

a light receiving element having a light-receiving plane for receiving the optical signal from ~~the~~ an output plane of the multi-mode fiber; and

a receptacle for connecting to the multi-mode fiber to affix the output plane of the multi-mode fiber at a predetermined distance from the light-receiving plane, wherein

said light receiving element receives a lower order mode of the optical signal and a higher order mode is prevented from entering the light-receiving plane of said light receiving element, and

the predetermined distance is determined based on a core diameter of the multi-mode fiber, a diameter of the light-receiving plane, and a maximum angle among angles of modes of the optical signal outputted from the output plane of the multi-mode fiber which are capable of entering the light-receiving plane.

9. **(Currently Amended)** An optical transmission system for transmitting an optical signal ~~from a transmitter to a receiver~~ through a multi-mode fiber, the optical transmission system comprising:

~~a~~wherein the transmitter comprises comprising:

a light emission element for generating an optical signal; and

at least one lens for converging the optical signal generated by ~~the~~ said light emission element ~~to focus at a focal point~~, wherein:

the optical signal converged by ~~the~~ said at least one lens enters an input plane of the multi-mode fiber, propagates through the multi-mode fiber, and is outputted from an output plane of the multi-mode fiber,

an optical axis of said at least one lens is aligned with a fiber axis of the multi-mode fiber,

a vertex of said at least one lens is located at a first predetermined distance from the input plane of the multi-mode fiber, the first predetermined distance being greater or less than a distance from the vertex of said at least one lens to a focal point of said at least one lens, and

the first predetermined distance is selected based on an eye opening factor of the multi-mode fiber and a power of the optical signal; and

~~a~~the receiver comprises comprising:

a light receiving element having a light-receiving plane for receiving the optical signal from the output plane of the multi-mode fiber; and

a receptacle for connecting to the multi-mode fiber to affix the output plane of the multi-mode fiber at a second predetermined distance from the light-receiving plane, wherein

said light receiving element receives a lower order mode of the optical signal and a higher order mode is prevented from entering the light-receiving plane of said light receiving element, and

the second predetermined distance is determined based on a core diameter of the multi-mode fiber, a diameter of the light-receiving plane, and a maximum angle among angles of modes of the optical signal outputted from the output plane of the multi-mode fiber which are capable of entering the light-receiving plane; and

~~the input plane is placed at a position other than the focal point, and the light-receiving plane of the light-receiving element is placed at a predetermined distance from the output plane.~~

10. **(Currently Amended)** The optical transmission system according to claim 9, wherein the input plane of the multi-mode fiber is placed at a position farther away from a vertex of the said at least one lens than the focal point of said at least one lens.

11. **(Currently Amended)** The optical transmission system according to claim 9, wherein ~~the~~ the said light receiving element is a Si PIN photodiode.